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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/530,304

04/04/2005

Jozeph Peter Karl Hoefsmit

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS

P.O. BOX 3001

BRIARCLIFF MANOR, NY 10510

EXAMINER

LEE, HSIEN MING

ART UNIT

PAPER NUMBER

2823

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

04/04/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/530,304	Applicant(s) HOEFSMIT, JOZEPH PETER KARL	
	Examiner Hsien-ming Lee	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6, 8 and 9 is/are rejected.
- 7) ☒ Claim(s) 4, 5, 7 and 10 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 April 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

HSIEN-MING LEE
PRIMARY EXAMINER

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

3/29/07

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

The current application does not comply U.S. practice as to the arrangement of the specification. See M.P.E.P 608.01(a) In particular, each section headings are missing in the current application.

Content of Specification

- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.
- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) The Names Of The Parties To A Joint Research Agreement: See 37 CFR 1.71(g).
- (e) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.
- (f) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:
 - (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."

- (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."
- (g) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.
- (h) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.
- (i) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.
- (j) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).
- (k) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an

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abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).

- (l) Sequence Listing. See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitations as recited in claim 4 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as, “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objection

3. Claim 7 is objected to for the following informality:

On line 2, changing “the connection region of the drain ..” into – a connection region of a drain .. --- is suggested.

On line 6, “frist” should have been written as – first --.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Huang et al. (US 6,249,433).

In re claim 1, Huang et al., in Fig. 3, teach a semiconductor device comprising a thermally and electrically conductive bottom plate 100 (i.e. a heat sink) on an upper side of which there is a semiconductor element 110 with a first connection region (i.e. the left region on top surface of the semiconductor element 110 where a bonding wire is connected to) and a second connection region (i.e. the right region on top surface of the semiconductor element 110 where a bonding wire 150 is connected to), said regions being coupled to, respectively, a first conductor 132 and a second conductor 132, said semiconductor element 110 being surrounded by an electrically insulating synthetic resin envelope 160 that covers a side face of the bottom

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plate 100, which side face is provided with a recess 102 that is filled with a part of the envelope 160, characterized in that the recess 102, viewed in cross-section at right angles to an edge of the bottom plate 100, takes the form of a staircase with at least two steps 102a and 102b.

In re claim 2, Huang et al. teach that the first 132 and second 132 conductors form an assembly 130, of which part is coupled to, respectively, the first and the second connection region, which parts are also being surrounded by an electrically insulating synthetic resin envelope 160 (Fig.3).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3, 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. in view of Polese et al. (US 5,972,737).

In re claim 3, Huang et al. do not teach the specific height and width of the steps as claimed. Huang et al., however, suggest that the selection of the height and the width of the steps is a consideration of eliminating flashing due to roll-over (col. 3, lines 34-47).

Therefore, at the time of the invention was made, one of the ordinary skill in the art would have been motivated to select a desirable height and width of the steps (i.e. the claimed recess) for the bottom plate, as suggested by Huang et al., in order to eliminate flashing (col. 3, lines 46-47).

In re claim 6, the teachings of Huang et al. are illustrative rather than restrictive (col. 4, lines 1-4). One of the ordinary skill in the art, at the time of the invention was made, would have been motivated to apply the teachings of Huang et al. to the situation where the transistor needs heat draining, as evidenced by Polese et al. (col. 6, lines 65-66), since by this manner the transistor as the semiconductor element can be well protected.

In re claim 8, Huang et al., in Fig. 3 and corresponding text, teach a method of manufacturing a semiconductor device, comprising the steps of:

- providing an electrically conductive bottom plate 100 (i.e. a heat sink) having an upper side and a lower side, and a side face, at which side face a recess 102 is present, with its lower side on a support plate;
- securing a semiconductor element 110 on the upper side of the bottom plate 100, which semiconductor element 110 is provided with a first connection region (i.e. the left region on top surface of the semiconductor element 110 where a bonding wire 150 is connected to) and a second connection region (i.e. the right region on top surface of the semiconductor element 110 where a bonding wire 150 is connected to);
- providing an assembly 130 of a first conductor 132 (i.e. the left one) and a second conductor 132 (i.e. the right one), such that a part thereof is coupled to, respectively, the first and the second connection region;
- surrounding the semiconductor element 110 and the parts of the conductors 132 coupled thereto by an electrically insulating synthetic resin envelope 160, such that it covers also the side face of the bottom plate 100; and

- the recess 102 of the bottom plate 100 has or is given the shape of a staircase with at least two steps 102a and 102b, when viewed in a direction transverse and perpendicular to the edge of the bottom plate 100.

Huang et al. is silent as to the electrically insulating synthetic resin 100 being above a support plate.

However, one of the ordinary skill in the art, at the time of the invention was made, would have readily recognized that it is necessary to have the support plate underneath the electrically insulating synthetic resin during the fabrication since without the support structure under the electrically insulating synthetic resin, it would be impossible to assemble all parts (e.g. parts 100, 120, 110, 132 as shown in Fig.3) above the support plate (not shown).

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. in view of Polese et al. as applied to claim 8 above, and further in view of Sun (US 2004/0042153).

Huang et al in view of Polese et al. do not teach that the recess in the thermally and electrically conductive bottom plate (i.e. heat sink) is formed by means of a punch technique.

However, using punch technique for forming the heat sink is in known in the art, as evidenced by Sun (paragraphs {0007}, [0035] and [0037]). Therefore, one of the ordinary skill in the art would have been motivated to use punch technique, as taught by Sun, for forming the recess in the bottom plate of Huang et al. in view of Polese et al.. The motivation/suggestion for doing so is to provide a fast and cost-effective means for forming the thermally and electrically conductive bottom plate with specific configuration.

Allowable Subject Matter

9. Claims 4, 5, 7 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

In re claim 4, none of the prior art of record, either alone or combination, teaches or suggests comprises a further electrically conductive bottom plate that is separate from the bottom plate and on which a further semiconductor element is situated having a first and a second further connection region.

In re claim 7, none of the prior art of record, either alone or combination, teaches or suggests that connection region of the drain of the MOSFET borders on the bottom plate that projects from the envelope and that forms the drain connection, and wherein the connection regions of the source and the gate of the MOSFET are situated on a side of the MOSFET opposite the connection region of the drain.

In re claim 10, none of the prior art of record, either alone or combination, teaches or suggests that the assembly of conductors and the bottom plate is formed from two conductor frames, one of which comprises the bottom plate and a conductor, and the other one of which comprises another conductor.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hsien-ming Lee whose telephone number is 571-272-1863. The examiner can normally be reached on Tuesday-Thursday (7:30 ~ 6:00).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hsien-ming Lee
Primary Examiner
Art Unit 2823

March 29, 2007

HSIEN-MING LEE
PRIMARY EXAMINER

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